6/4

MARATECH
R & D Technology Transfer Journal

Marad Develops Port Software

In an effort to assist port planners, managers and users, maritime researchers from the State University of New York recently finished a project aimed at utilizing recent advances in microcomputer hardware and software.

The report, *"Decision Support Systems for Port Planning and Management,"* describes in three documents how a software system developed for the Port of New Orleans helped reduce operational costs for port planning and management. The system, implemented on an IBM Personal Computer running a Lotus 1-2-3 application program, is designed to function in a work sheet manner with files organized by subject.

Data disks, obtainable from Marad, contain data files concerning a particular port area. One file contains space-specific information such as port location, purpose, cargo, owner, transportation access, berthing depth, space and other physical characteristics. Other files cover areas such as anchorage areas, fleeting facilities, wharf characteristics, navigational hazards, river characteristics, pollution calculations, shore characteristics, transportation facilities, and historic dredging information.

Some practical applications of the system include site selection for barge fleeting and port facilities, project screening for port permits, and reviewing dredging projects. The system is flexible enough to allow managers to present their results in various forms. Results can be displayed on the screen for quick reference, printed for study, incorporated with a word processor for inclusion in a report, or stored for future use.

Presently, data disks are only available for the Port New Orleans area and the Mississippi River basin. Interested parties are encouraged to obtain the Final Report in which an overview of the system is fully discussed. Two other documents consist of the system user's manual and an atlas of the Mississippi river basin. They can be purchased from NTIS.

Order:	Final Report,	#PB86-107133	$ 9.95
	User's Manual,	#PB86-107158	$ 9.95
	Atlas,	#PB86-107141	$ 9.95
	Data Disks,	#PB86-107125	$ 165.00

Office of Port and Intermodal Development
Contact: Carl J. Sobrearnisana (202) 426-4357

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Slew Crane Evaluation

In an effort to keep U.S. shipbuilders up-to-date with recent advances in the development of shipbuilding techniques and tools, Marad has released a cost-benefit study examining the various types of cranes presently used in shipyards around the world.

The report, *"Slew Cranes in Shipyards,"* is written for the manager who knows little about slew cranes and yet has to make the final decision to buy one. It is extremely readable in layman's language, provides a history of cranes in industry, defines all needed technical terms, and is tailored to U.S. shipyards.

Most important, the study provides a detailed examination of five actual cranes with a view to establishing the investment cost of each type—its "cost-to-build"—and its maintenance and running costs. Operational efficiencies, the speed, accuracy, and downtime of each crane type, are also investigated.

In particular, the study focuses attention on four aspects of crane design that impact most significantly on shipbuilding

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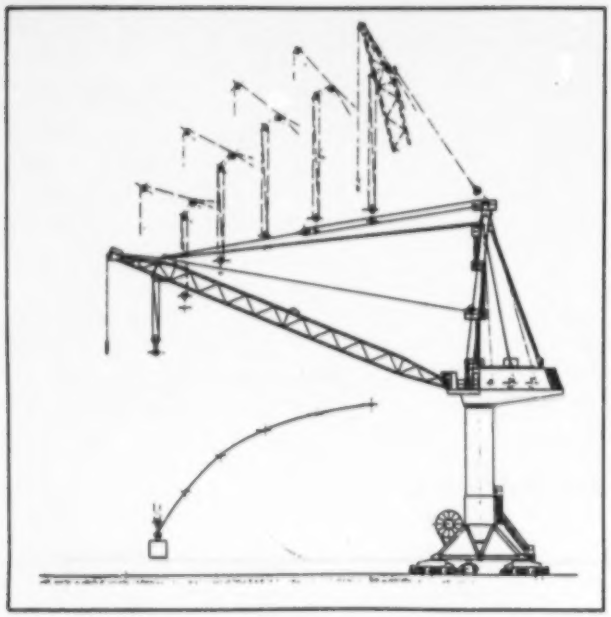


Single-Jib Slew Crane with Simple Hoist Rope: Basic Load Path when Luffing

operations: 1) double-boom as opposed to single-boom design; 2) column mounting as opposed to turntable mounting for the slewing part of the crane; 3) balance boom as opposed to unbalanced boom design; and 4) the provision of level luffing as opposed to traditional luffing.

Conclusions are made along several areas of needs, heavy-duty, medium-duty, and light-duty, with cost comparisons given in terms of multipliers. The use of multipliers eliminates the effects of the ever changing currency markets and provides a truer comparison of cranes.

The report is available through NSRP.

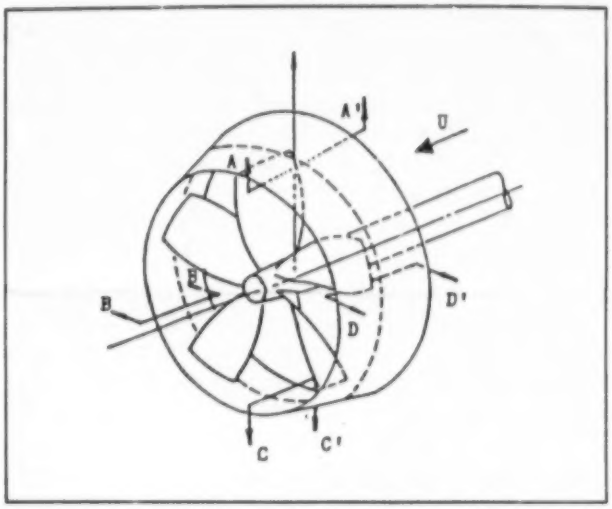
Office of Advanced Ship Development and Technology
Contact: Joel C. Richard (202) 382-0444

Advanced Propeller Duct Design

The Stevens Institute of Technology finished a report detailing the advantages and disadvantages of three different propeller duct design procedures for ships serving the merchant marine and U.S. Navy.

The report, *"A Procedure for Design of Ducts to Reduce Propeller Cavitation and Vibrations,"* focuses on the effects that ducts have on the flow of water around the propeller and their related vibration and cavitation effects. Cavitation, the creation and collapsing of vacuum bubbles in water, is one of the major causes of premature wear on propeller blades.

The three designs encompass either the Kort-Nozzle type, for ships heavy loaded, or the Pumpjet type, for tug-boats and trawlers. Advantages derived from these designs can be either increased water flow rates, thereby reducing propeller load and increasing efficiency for large ships, reduced cavitation, thereby increasing propeller life, or decreased water flow rates, thereby reducing vibration and noise for ships that have need to be quiet for tactical reasons.



Configuration of ducted propeller

The use of ducts enshrouding propellers has long been a standard design practice for submarines and torpedoes, but not generally for surface ships. This has remained so due to a lack of conclusive evidence showing an increase in efficiency of ducted propeller ships versus non-ducted propeller ships.

The report is highly mathematical in nature and provides a well documented analysis for the interested naval engineer or architect.

Order NTIS #: PB85-197895 $28.95

University Research Program
Contact: Fred Seibold (202) 382-0353

Also Available:

From Stevens Institute of Technology is a prerequisite study to *"A Procedure For Design of Ducts to Reduce Propeller Cavitation and Vibrations"* titled *"Calculation of Hydrodynamic Side Forces and Yaw Moments of Merchant Ships."* The report details the partial-order differential equations used in determining the forces and moments a ship encounters at sea. It could prove useful to the naval engineer interested in this area of ship operations.

Order: # PB84-127182 $11.95

MATERIAL MANAGEMENT: Key to Cost Control

With material cost for building a commercial ship approaching 60 to 70% of total cost, the National Shipbuilding Research Program, in conjunction with Todd Pacific Shipyards Corporation, has recently released a comprehensive manual concerning material management as it applies to U.S. shipbuilding.

The report, *"Product Oriented Material Management,"* was developed through observations, evaluations, and discussions with Ishikawajima-Harima Heavy Industries of Japan, one of the most cost efficient shipyards in the world, and provides a textbook like approach to properly keeping material costs under control.

The report holds that processes employed by American shipbuilders leading to delivery of materials to production sites, consume more time than is necessary and are inefficient. As a consequence, U.S. shipbuilders suffer a great deal in material management. In Japan, major shipbuilding firms routinely order about 70% of the total material for a ship when only 30% of the design is complete.

Major problems observed are:

1. Preparation of purchase order specifications (POS) is too slow,
2. Vendors require relatively long durations for bidding,
3. Vendor furnished information is either late or insufficient to support timely design development,
4. Relatively long lead times are required for material deliveries,
5. Promised delivery dates are not reliable enough, and,
6. Insufficient use of standards requires extraordinary dependance on POS preparation.

This manual is available from NSRP.

Office of Advanced Ship Development and Technology
Contact: Joel C. Richard (202) 382-0444

Computer Aided Fleet Deployment

A two-year research effort aimed at deriving and implementing optimization models for fleet deployment on personal computers was recently completed at the University of Michigan, Ann Arbor, MI. The results of the study, *"Optimization Schemes for Rational, Computer-Aided Fleet Deployment,"* were several computer programs capable of providing solutions for several versions of fleet deployment.

Since many of the problems encountered in merchant fleet deployment involve both economic and non-economic criteria, the scope of the programs covers a wide range of scenarios. A wide variance in fleet operations, scheduling, routing and fleet design is considered.

Extensively covered is an aspect of fleet deployment known as "slow steaming analysis." Slow steaming is the practice of operating a ship or fleet of ships at a speed less than design or maximum operating speed, in order to take advantage of improved fuel economy and reduced operating costs.

Another helpful feature is the use of sensitivity analysis in understanding the influence of the changes in a fleet's various components on operating costs. For small to moderate changes of one or more cost components, the user receives an accurate estimate of new total operating costs. This feature is especially useful for playing out "What-if" scenarios and adjusting for bad weather or accidents. A case application specifically cited is a fleet deployment problem involving multi-origin, multi-destination cases.

All programs are designed to run on IBM-compatible microcomputers and are available with documentation at cost to the industry from the University of Michigan. The Final Report on the project is available from NTIS.

Order #:	PB86-161965 A/S	Final Report	$16.95
	PB86-161957 A/S	Exec. Summary	$ 9.95

University Research Program
Contact: John Dumbleton (202) 382-0350

Radio Navigation Plan

There are two more regional maritime users' conferences being held to allow comments on the 1984 Federal Radio Navigation Plan by ship owners and operators. These are:

Chicago, Ill	April 17, 1986 Midland Hotel
Washington D.C.	May 22, 1986 Rosslyn Westpark Hotel

For more information contact: Joe LoVecchio (617) 494-2131

FIRST ANNIVERSARY: Journal of Ship Production

"The Journal of Ship Production," published by the Society of Naval Architects and Marine Engineers, celebrated its first anniversary last month and is well on its way to many more. The publication is dedicated to presenting, for critical examination, the results of technical research relevant to professional persons in the ship production industry.

To subscribe write: SNAME, 1 World Trade Center,
RM 1369, N.Y., N.Y. 10048

Cargo Guide Starts 3rd Printing

The Government Printing Office, in conjunction with MARAD, has commenced the 3rd printing of *"A Shipper's Guide to Stowage of Cargo in Marine Containers.* This guide has sold over 8,000 copies to date. It is intended as a guide to procedures which will be helpful in avoiding potential danger and economic loss associated with improperly stowed containers. The guide describes the consequences of improper stowage, and how to avoid them by specifying the proper size and type of container. Also included are stowing and securing guidelines for the eight basic cargo types. The guidelines set out in this publication can aid those involved in loading of ocean containers in working more safely and efficiently.

To order contact: Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Marine Propulsion Conference

The Society of Automotive Engineers (SAE) will hold its 1986 Marine Propulsion Technology Conference on May 12–14 at the Sheraton Hotel in Crystal City, Virginia. The conference will feature several panels on the future of the diesel engine and a keynote address by Congressman George E. Brown, D-CA, and member of the House Science and Technology Committee. Interested parties should contact the SAE at (412) 776-4841, Ext 332.

National Shipbuilding Research Program (NSRP)

All NSRP reports have been abstracted, indexed and copied into a microfiche library. Copies of the NSRP Reports Bibliography, and/or copies (either microfiche or hard) of reports can be obtained at a nominal charge from:

NSRP Publications Coordinator
Transportation Research Institute
The University of Michigan
Ann Arbor, Michigan 48109

Marine Industry Standards Meeting

The Society of Naval Architects and Marine Engineers (SNAME) Panel SP-6 on Marine Industry Standards will conduct its regularly scheduled meeting on May 15, 1986 at the Wyndham Franklin Plaza Hotel in Philadelphia, PA to discuss ongoing and future projects to improve the productivity of U.S. shipyards through the development and implementation of shipbuilding standards. Future SP-6 standards projects will be geared towards accelerating efforts leading to more published commercial ASTM standards and the full implementation of these standards in both Naval and commercial ship construction.

The meeting of Panel SP-6 will follow the May 12–14, 1986 meeting of ASTM Committee F-25 on Shipbuilding Standards, also being held at Wyndham Franklin Hotel. Committee F-25 develops and publishes marine industry standards that will result in direct benefits in the form of reduced cost in the design, construction, and repair of marine vessels.

Interested individuals should contact Mr. Thomas M. O'Toole, *SNAME* Panel SP-6 Vice Chairman, at (207) 443-3311, extension 2943.

National Technical Information Service (NTIS)

To order any reports listed in MARATECH, contact the National Technical Information Service at:

5285 Port Royal Road
Springfield, Virginia 22161
(703) 487–4650

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